

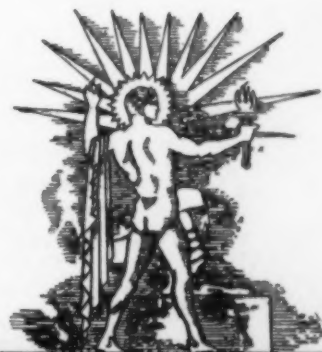
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THE WEEKLY SUMMARY OF CURRENT SCIENCE •



DECEMBER 14, 1935

Cable's Eye View
See Page 372

A

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Current Science

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DO YOU KNOW?

Decorative mirrors are now made of flesh-tinted, aquamarine, blue, or transparent glass.

Fur resources in the United States yield an annual income to trappers of \$65,000,000.

Approximately a million people in the United States have at least one bone broken in the course of a year.

That cancer is not common among primitive people is now explained mainly on the ground that they do not live long enough to die of this disease.

Russia has an electrified village, in which electricity heats the piggeries, drives the power churns, milks the cows, transports grain from one process to another, and provides power and light for the houses.

In Massachusetts alone there are so many people suffering from arthritis that they would provide 22 patients to each physician in the state; yet it is estimated that 70,000 are receiving no treatment whatever.

Pruning mature apple trees does not significantly improve the fruit, is the verdict from experiments at Cornell University.

Electric heaters that can be attached to any electric socket have been made to keep valuable rose bushes or other plants warm on frosty nights.

A case of lead poisoning in Boston was traced to the fact that the house water system was connected with the main by a 100 foot lead pipe.

It is a good safety device to dress children in gay colored outdoor clothes in wintertime to make them conspicuous, advises the U. S. Bureau of Home Economics.

A 1,500-acre tract in Brown County, Indiana, has been made a hunting area where archers can hunt game with bow and arrows.

A farm research report says that sauerkraut juice contains about the same food value as the solid kraut, and the juice has more vitamin content than the solids.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

ARCHAEOLOGY

Were merchants associations known in the second century? p. 373.

ARCHAEOLOGY—SURGERY

How old is brain surgery in America? p. 377.

BIOLOGY

How has discovery of heavy water hindered the biologist? p. 376.

Was life originally a hitch-hiker from outer space? p. 378.

ECOLOGY

Are weeds of value to agriculture? p. 382.

ENGINEERING

Do rows of trees beside a road serve as effective windbreaks? p. 379.

What is the speed limit for trains in Germany? p. 376.

GENERAL SCIENCE

What changes are recommended for the Patent Office? p. 374.

MEDICINE

How can drunks be saved from death-threatening stupor? p. 372.

PHYSICS

Are taxes higher for atoms as well as men? p. 380.

Can statistics reconcile conflicting theories of physics? p. 376.

How can scientists "see" into the upper atmosphere with searchlights? p. 371.

How has the Federal Communications Commission blocked scientific research? p. 378.

What is the newest use for cosmic rays? p. 376.

Who has grown crystals of lithium fluoride in the laboratory? p. 379.

PHYSIOLOGY

Of what medical use is a dead man's heart? p. 373.

Why should stutterers walk on all fours? p. 371.

PLANT PATHOLOGY

Of what use are squirrels in fighting plant disease? p. 376.

PSYCHIATRY

How does psychiatry duplicate "miraculous" cures? p. 382.

PSYCHOLOGY

When is the best time to memorize? p. 372.

RADIO

Can static be avoided on the radio during lightning? p. 380.

PHYSICS

"Fingerprinted" Light Gives Clue to Upper Atmosphere

Searchlights Shooting Beams, Interrupted at Given Frequency, Used to Explore Regions 20 to 50 Miles Up

A NEW method of discovering what exists in the unexplored upper air beyond the reach of balloons, some 20 to 50 miles above the earth, has been developed by three Washington physicists connected with the Carnegie Institution's Department of Terrestrial Magnetism and the U. S. Department of Agriculture's Bureau of Chemistry and Soils.

Searchlights will be used to shoot light into the night sky, light that is "fingerprinted" by being interrupted at a given frequency using a "light-chopper" so that when it is scattered by the upper air and picked up by large mirrors it can be recognized by tuning the observing instruments.

From what happens to the light in the upper air's greatest unknown region

will come the answer to some questions that science is eagerly asking.

How the thinning air's density varies with height some thirty miles above the stratosphere, in the region known as the "ozonosphere" and the "altotroposphere," will become known. This is important basic information now lacking.

The research team that has taken the first steps toward conquest of the region between where the stratosphere leaves off and the aurora begins to be born, consists of Dr. M. A. Tuve and Dr. E. A. Johnson of the Carnegie Institution of Washington and Dr. Oliver R. Wulf of the U. S. Department of Agriculture. They gave the first hint of their researches in a short letter published in the current issue of the *Physical Review*.

So far tests have been confined to an artificial light in the laboratory but field tests are being organized, probably with the aid of large Army-type searchlights of great brilliance. Just one large searchlight is expected to furnish enough light for the experiment, thanks to the device of using "chopped" light.

Once the delicate instruments are put into use analyzing the scattered "fingerprinted" light gathered by the mirror, the scientists expect to solve other numerous problems, connected with water vapor, turbulence, winds and dust, as well as the chemical state of the rarefied atmosphere that allows it to shine with fluorescent light at times.

Too High for Man

In no other way can science adequately probe the region 20 to 50 miles above the earth. Man-carrying balloons "highest up" is the 14 miles of the recent stratosphere flight. Unmanned balloons can reach only about 20 miles altitude, the top of the stratosphere. At about 60 miles above the earth there is found the base of the auroral displays and the first of the ionized or electrical layers that reflect radio waves. The region between stratosphere and the altostratosphere, which begins at about 60 miles, can be probed with no means so far suggested except the modulated Tuve-Johnson-Wulf light.

Using light as a probe was originally suggested about five years ago by an English scientist, Dr. E. H. Syngé, who wanted the Army and Navy to assemble several hundred searchlights and shine them on one place in the upper air. The tests made by the Washington scientists, however, indicate that by using "fingerprinted" light even better information should be obtained with a single searchlight aimed at the sky.

Science News Letter, December 14, 1935

PHYSIOLOGY

Stuttering Stopped By Walking on All Fours

WALKING on all fours as a remedy for stuttering sounds like a fantastic, Alice-in-Wonderland dream. But it actually worked in the case of stutterers studied at the University of Michigan laboratory of biophysics, Hazle Geniesse reports. (*Science*, Nov. 29)

Miss Geniesse does not suggest that stutterers immediately drop on all fours when they want to speak. But she believes the studies indicate a new approach to the problem and suggest new methods of treating the condition.

"A marked improvement, even to



TO EXPLORE BEYOND STRATOSPHERE WITH LIGHT

Dr. M. A. Tuve, left, and Dr. E. A. Johnson setting up light and electrical apparatus that will be used to detect searchlight illumination scattered from 20 to 50 miles high above the earth. By use of "fingerprinted" light, these Carnegie Institution of Washington scientists, with the help of Dr. Oliver R. Wulf of U. S. Department of Agriculture, expect to discover just what exists in the unexplored region of the upper air. The large mirror will gather up the light from the sky.

complete cessation of stuttering, was noted when the stutterer spoke while walking on all fours," she reported from her study of twenty-four cases.

No explanation can as yet be given for the phenomenon, Miss Geniesse states, but she has a theory about it. Reduced to very elementary terms, it is a matter of blood pressure and spasm in part of the brain. If stuttering is looked on as a kind of spasm, it may be caused by a temporary stimulus to a motor nerve cell. The stimulus, in turn, may

be caused by temporary dilatation of small blood vessels in part of the brain. Getting on all fours changes the blood pressure, releases the blood that dilates the small blood vessels, the state of spasm stops, and the stutterer carries on a more nearly normal conversation.

"If this view proves correct," Miss Geniesse states, "then present theories and methods for correcting stuttering should be revised and greater efforts should be made to place them upon a physiological basis."

Science News Letter, December 14, 1935

PSYCHOLOGY

Sleep After Memorizing Makes Recall Easier

IF A PERSON memorizes certain kinds of material perfectly, and goes to sleep afterwards, he will recall more of it, and also re-learn the whole task more economically after a lapse of 24 hours, than if he waits even a few hours before he goes to sleep, Dr. H. M. Johnson, professor of psychology of American University, Washington, D. C., announced at Cornell University.

Experiments based on different methods, made by Dr. Rosa Heine Katz, at the University of Göttingen, and by Joseph F. O'Brien, graduate student at American University, showed that all the subjects who were studied were better able to recall and also to re-learn material that they had learned by rote and partially forgotten, if they first slept for eight hours and then worked for 16 hours, than if they distributed their rest and activity in any other way during the 24-hour period.

The differences in favor of sleeping immediately varied between 20 per cent. and 30 per cent., according to the subject and the task. One would be justified in offering a bet of 100,000 to one that Mr. O'Brien's results were not due to chance, Dr. Johnson said.

Two explanations have been offered. One, which Dr. Johnson called the "hardening" hypothesis, pictures the brain as inert during sleep, giving recently received impressions a chance to become "set." The other, called the "reverberation" hypothesis, regards the brain as an active organ even during sleep, and supposes that it goes on repeating or "reverberating" recently received impressions during the unconscious period.

Dr. Johnson does not regard either

hypothesis as satisfactory. The "hardening" hypothesis is cast into doubt by the poor recall of memorized material made by persons who had "hardened" their brains with the equivalent of only one highball. Furthermore, very recent studies on brain waves show that these fluctuations in the electric potential of the brain go on continuously during sleep, though not in their ordinary "waking" patterns. Finally, studies on sleep conducted by Dr. Johnson himself several years ago at the Mellon Institute show that sleepers assume muscular positions which they can maintain only by dint of strenuous brain exertion.

Dr. Johnson offered a third hypothesis, which, however, he did not urge as necessarily correct. He suggested that the memorized material might "reverberate" in the brain, but during the drowsy periods before sleep and during the slow awakening process, and also during the frequent half-wakeful periods during the night which most persons experience without realizing or remembering them.

Science News Letter, December 14, 1935

MEDICINE

Treatment Saves Drunks From Dangerous Stupor

FOR DRUNKS who have reached a state of coma, medical science has discovered an emergency treatment. The new treatment will bring them speedily out of the dangerous state of paralytic alcoholism which sometimes leads to death. Dr. Leon J. Robinson and Dr. Sydney Selesnick of Boston City Hospital report results of the treatment. (*Jour-*

nal, American Medical Association, Nov. 30)

These cases of acute alcoholism are brought immediately to the hospital, and are allowed to breathe a mixture of 10 per cent. carbon dioxide and 90 per cent. oxygen for half an hour or longer. This, in the words of the Boston physicians, is what happens:

"In every case of unarousable alcoholic coma, with slow, jerky, shallow respiration and cyanosis, carbon dioxide-oxygen inhalation caused the respirations to become deep and regular almost at once."

The doctors emphasize that this is an emergency treatment and is not indicated in the moderate degrees of intoxication frequently encountered.

By comparing man with animals, these doctors believe that it would require about a pint of whisky taken at once to cause coma in man. This coma, accompanied by troubled breathing, paralysis and blueness of the skin, constitutes a medical emergency. Death may be definitely prevented and recovery hastened by the inhalation of this mixture, they declare.

Administration of this treatment increases the amount of alcohol exhaled from the lungs and so decreases the total alcohol in the body.

The Boston physicians make no attempt completely to arouse the stuporous patient but merely use this treatment to reduce him from a state of dangerous paralytic alcoholism to a less deep stage of anesthesia from which he can be expected to recover safely.

Science News Letter, December 14, 1935

ENGINEERING

Concreting Nearly Done At Norris Dam of TVA

See Front Cover

SUSPENDED high in the air from the cable-way, the photographer looked down on the view of Norris Dam which appears on the front cover of this week's SCIENCE NEWS LETTER.

Water is now impounded to a depth of 50 feet. When full, the dam will back water 40 miles up the Clinch and Powell River valleys.

Ninety-five per cent. of the concrete has now been poured.

Science News Letter, December 14, 1935

Cornell scientists hope for a time when hens can be bred and managed, so as to produce eggs for many years, thus doing away with the expensive process of renewing at least half of a flock each year.

PHYSIOLOGY

Dead Hearts Brought to Life Aid Study of Drug Effects

Action of Various Common Heart Medicines Tested On Organs In Differing Conditions of Muscle Tone

HEARTS from dead men, revived for scientific experiment, are giving new knowledge of how to use the drugs that aid heart afflictions. Experiments wherein fresh blood was pumped through dead hearts until they started beating freely again have just been reported by Dr. William B. Kountz of Washington University School of Medicine at St. Louis.

The drugs commonly used to treat disease may be helpful or harmful, depending on the state of the heart, Dr. Kountz found.

In the type of heart disease Dr. Kountz investigated and reported to the Southern Medical Association, the small arteries of the heart muscle itself are closed. Blood therefore cannot get through to nourish the muscle and keep the heart at work pumping blood into the rest of the body.

Physicians have lately been treating this heart ailment by giving drugs that would dilate the closed or dangerously narrowed arteries, on the theory that widening the arteries would help to keep the blood flowing through them. They learned which drugs to use by studying the drug's action on the heart arteries of experimental animals.

The use of the artery-expanding drugs in human cases of heart disease has, however, not been entirely satisfactory, Dr. Kountz observed. His research seems to show why. In human hearts, he found, the state of the heart or the tone of the heart muscle is the chief factor influencing the flow of blood through the heart's arteries.

Dr. Kountz tried the effect of various common heart medicines, such as nitrites, liver extract, theobromin, digifolin and adrenalin, on the hearts he had revived. Their action on the heart was entirely different when the heart muscle was contracted from when it was relaxed. Nitrites, for example, which ordinarily increase the flow of blood through the heart's arteries, increased it still more when the heart muscle was contracted, but lost their effect entirely when the heart muscle was relaxed.

Physicians will know better what

drugs to use in treating heart disease if they classify heart ailments according to the state of the heart as far as it can be determined by studies of the patients, Dr. Kountz advised in conclusion.

Science News Letter, December 14, 1935

ARCHAEOLOGY

Club Life in 159 A. D. Revealed by Expedition

A GLIMPSE into club life of 159 A. D. is the latest revelation from ruins of Dura on the Euphrates, announced by Yale University.

The joint expedition of Yale and the French Academy of Inscriptions has dis-

covered in the ruined city a merchants' club house, richly decorated with bas-reliefs.

The club house was used by caravan merchants of three cities — Dura, Palmyra, and Anath — and also by mounted archers who served as desert guards for the caravans. Combining religion with relaxation, the club was also a temple to the "Fortunes" of the sister caravan cities.

Sculptured decorations in the building show the deities that served each city as "Lady Luck."

Excavation of the famous synagogue at Dura, built in 245 A. D. has been completed, with additional discoveries of paintings showing early Jewish ideas of Old Testament scenes. Queen Esther and King Ahasuerus seated on the throne of Solomon are portrayed in one of these extremely early paintings of Bible stories.

Dura's cemetery is also being explored with good results, says the report. Robbers, ancient and modern, had rifled most of the graves, but several untouched burials have yielded coins, pottery, glass, and other objects used in the ancient city.

Science News Letter, December 14, 1935



LADY LUCK IN 159 A.D.

This lady, Atargatis by name, guarded the good fortune of the great caravan city Palmyra. Merchants, in particular, paid homage to lady luck, and this bas relief is discovered in ruins of a merchants' club house, at Dura-on-the-Euphrates. Each of the three cities that sponsored the club had its own patron deity carved in the decorations. Palmyra's lady is shown crowned by victory, while the donor of the art piece looks approvingly on.

GENERAL SCIENCE

Scientists to Advise Nation

President's Science Advisory Board Expires, But New Body is Formed; \$3,500,000 Research Fund Proposed

MOBILIZATION of the best scientific minds of the nation to aid government scientific work and an appropriation of \$3,500,000 for scientific research by non-governmental institutions during the next two years are proposed by the report of the Science Advisory Board to President Roosevelt. The term of appointment of the Board lapsed on Dec. 1.

However, scientists' advice will continue to be available to Government departments, through a new advisory body of non-governmental research men. The new group was organized by the National Academy of Sciences, in response to a request from President Roosevelt transmitted to the Science Advisory Board and published in its final report, just off the press.

"Our national health, prosperity and pleasure largely depend upon science for their maintenance and their future development," the report declares. National welfare is dependent upon adequate scientific information, the report states, independent of political theories. Science is "basic to attempts at national planning or improvement of any kind or degree."

The Science Advisory Board looks with approval upon the government's scientific services which supplement other government activities, such as the scientific aids to national defense and the development of standards for the purchasing of supplies for governmental use.

Commendation was also given to such activities as those of the National Advisory Committee for Aeronautics which "hold evident promise of benefiting the public but which are not proper or practical fields for private initiative."

The Importance of Maps

Freedom of scientific work from political or policy-making influences is also given as a prime consideration.

Great public works and large-scale private enterprises alike depend on accurate maps; and at present the map-making activities of the government are scattered through 28 different bureaus and offices, with resulting inefficiency and money waste. To remedy this situation,

the report recommends the establishment of a central mapping and survey agency.

Not all of the 28 existing map-making agencies will be combined at the outset, if the Board's recommendations are adopted. They stress the desirability of making haste slowly. The new body, for which the name U. S. Coast and Interior Survey is suggested, would be formed by the merger of the present Coast and Geodetic Survey, the Lake Survey, the International Boundary Commission, and the Topographic Branch and Division of Engraving and Printing of the Geological Survey. It is anticipated that other mapping agencies, at present left unchanged, would in the course of natural events gravitate into this nuclear organization.

Certain existing mapping and survey bodies are already so well organized, or have such highly specialized work to do, that they would probably never be changed. In these latter categories, the Board's report mentions the Soil Conservation Service, the Army Air Corps, the Federal Power Commission and a number of others.

Complete Topographic Work

The Board stresses the urgent need for completing the standard topographic map of the United States, of which now only about 25 per cent. exists in really acceptable form. Such a map, showing not only the outlines of things but accurately indicating mountains, valleys and all other grades of elevation, would pay for itself through savings on highway work alone, the report declares, continuing:

"But it is not in respect to highways alone that the need is urgent. All drainage, flood control and irrigation projects, water supply and power developments, mining operations, land classification, soil studies, location of railways, canals, sewers, transmission lines, parks and recreation centers, and an endless variety of other engineering, industrial and civic developments are peculiarly dependent on good topographic maps. Intelligent national, state and municipal planning is impossible without adequate maps, and the large pro-

grams recently undertaken have resulted in an unprecedented volume of requests for these indispensable tools of ordered progress. The New Deal has brought for maps a New Demand."

Recovery of American industry can be greatly aided by bringing American patent law and procedure up to date, the report declares. The end of a depression is normally marked by a great increase in inventive activity, and it is in anticipation of this upswing that the Board makes its recommendations, to facilitate the handling of the flood of Patent Office business and to speed up the use of the new ideas in industry.

Patent Reforms Proposed

Three changes in American patent procedure are proposed by the Board:

First: Descriptions of the article or process to be patented should be published in the Official Gazette of the Patent Office before the patent is granted, and not afterwards as in the present procedure. Persons with conflicting claims would be invited to state their case, and after a consideration of all evidence the patentability of the idea in question would be decided. It is believed that many hundreds of duplicate patents that now slip by the examiners could be caught by this method, and also that a great deal of the present endless patent litigation could be obviated.

Second: A special patents court should be established, with judges qualified in science and engineering as well as in law. This court would be far better qualified to handle questions of fact than present legal bodies can be expected to be, and for this reason alone would doubtless speed up the disposal of patent cases.

Third: A corps of specially trained patent advisers should be made available for the assistance of courts trying patent cases. These men would be scientists and technicians rather than lawyers. They would represent, in patent practice, the non-partisan expert witnesses hired by the court, whose substitution for the witnesses hired by contesting parties has been recommended for general court procedure.

The Board also favors the adoption of some system of taxing patents once issued, to discourage inventors or purchasers of inventions from letting them

lie idle and unused, as is often the case at present. This method of eliminating "dormant" patents has been used with success in certain European countries. The Board also recommends, however, that some reduction be made in the present cost of securing a patent, to offset the increased costs involved in the patent-taxing system.

Better pay and better working conditions for the Patent Office personnel are held desirable, and the suggestion is made that members of the force be given opportunity to visit leading factories, power plants, etc., to keep them up to date on the current uses of patents in industry.

Science and Land Use

Scientific research along new lines is needed for the formation of an intelligent and soil-saving land use policy in this country, the Science Advisory Board stated. Several recently developed lines of approach give new viewpoints, and present information in much more practically usable form.

Outstanding of these modern methods is the concept of "climatic areas" developed by Prof. R. J. Russell of Louisiana State University. From this approach, a desert, grassland or other climatic-geographic unit is not regarded as a fixed area drier in some years and wetter in others. It is rather seen as a type of climate dominating an area that expands in some years and contracts in others. Thus, the desert region of the West moved its boundary eastward during the great drought; and during the recent fall the rain-dominated Southeast pushed its boundaries toward the north and west.

The Changing Desert

A system of climatic area maps of this kind, it is pointed out, will be of great service in planning for the future, especially in regions of "climatic risk." If such information had been available in pioneer days, many of the "starvation lands" on the Plains would never have been offered to settlers. If it had been available even as recently as twenty years ago, it might have been possible to avoid breaking the age-old Western sod to plant wheat, with the inevitable consequence of country-wide dust storms during the past three years.

Another type of research called for concerns the physiological requirements of crop and forest plants. A great deal of dispute has gone on recently about the possibility of growing trees at all in the Plains shelterbelt area. Even experts have disagreed, simply because full



FIRST SCIENCE ADVISORY BOARD MEETING

At the first meeting in the National Academy of Sciences Building, Washington, August 23, 1933, were these scientists: (SNL, Aug. 19, 1933) Left to right—Drs. Bowman, Millikan, Compton, Leith, Campbell, Jewett, and Merriam.

knowledge is lacking of the behavior of various tree species under Western low-moisture conditions. Similarly, many losses have been incurred through the planting of field crops where they cannot be expected to pay: corn too far north, for example, or wheat too far south.

Similar studies on native vegetation and animal life, called phenology by scientists, are needed, the report states. Phenological research makes year-by-year records of such things as the flowering and fruiting of plants, the migration and nesting of birds. Since these native species have become well fitted into the conditions of their environment, full phenological data will often yield information about soil and climate of a given region in less time and at much lower cost than is possible by other methods.

More money for public health work will buy more health for America.

Campaigning for Health

This implication is contained in the report of the Science Advisory Board. The Board recommends an increase of \$2,000,000 in the 1936 budget of the U. S. Public Health Service. If obtained, this would mean about 40 per cent. boost in funds actually available for research and allied activities of the Service; for of the present budget of approximately \$10,000,000 about half is expended on Government hospitals.

Justification for increased support for the work of the Service is found by the Science Advisory Board in the record of achievement in the past. Not only has the Service done yeoman work in what might be called its regular day's

job, but a number of its scientists have made brilliant medical discoveries whose effects have been world-wide. The report cites, among other achievements, the classic work of Dr. C. W. Stiles on hookworm and methods for combating it, the discovery of the cause of tularemia by Dr. G. W. McCoy, the development by Drs. R. C. Spencer and R. R. Parker of a vaccine against Rocky Mountain spotted fever, and proof, developed by Alice Adams, that undulant fever in human beings and contagious abortion in cattle are caused by the same type of bacteria.

Much Service in Little Time

The Science Advisory Board, an unpaid, unofficial body, functioned from July 31, 1933 until Dec. 1, 1935. Its committees made studies and offered findings of which use was made in such governmental activities as the reorganization of the Weather Bureau, the establishment of the Soil Conservation Service, and the survey of mineral, water and soil resources. Still pending, and to be continued under the new set-up, are the researches of committees cooperating with the War and Navy Departments, the Patent Office, and the Weather Bureau.

New successes have been scored by a committee of the late Board in studies on design and construction of airships, which should result in the building of stronger and safer craft. They have found mathematical solutions for certain stress analyses, for which only approximations have been available up to date.

The Committee on Signalling for Safety at Sea has also (Turn to page 378)

PHYSICS

Scientists Reconcile Two Conflicting Atom Ideas

AN IMPORTANT inhabitant of the universe has sat for his portrait. Two very different and conflicting canvases, painted in scientific terminology, have resulted. Neither the sitter (the atom, to scientists) nor the artists, who are the physicists studying the composition of matter, are worried much about the conflict.

"Modern physics instead of deciding between them links them with the help of the statistical method," explained Dr. Edward Teller, Hungarian theoretical physicist, who has made his first public appearance in America as visiting professor of physics of the George Washington University.

Using mere figures of statistical theory as a microscope with which to view the atom is necessary because the idea that it is indivisible is a paradox, contradicting our ideas gained from everyday experience. Moreover, Dr. Teller observes, atoms can be probed only with other atoms used as tools, so that actions of individuals cannot be determined.

The compromise picture of the atom painted by mathematics is still opposed by some of the best physicists, Dr. Teller said, but the drastic procedure is accepted by most because it is successful and the philosophy of its method is satisfying. Studying atoms in bulk instead of trying to understand the behavior of individual atoms has also given scientists information about average actions of atoms and thus it is possible to understand properties of matter as a whole.

Science News Letter, December 14, 1935

ENGINEERING

Race Between Steam and Diesel Engines at Peak

WITH the fate of millions of dollars' worth of new railroad equipment at stake, the race between steam and oil-burning Diesel locomotives reached a new peak in 1935, it is indicated in the progress report presented by a committee of the American Society of Mechanical Engineers.

Steam, old standby of railroad propulsion, brought out fifteen new locomotives either streamlined or semi-streamlined for sustained high speed.

Three new Diesel-driven locomotives were put into service during the year, while twelve lightweight Diesel-electric

articulated trains went into operation in the same period.

Steam-driven trains ranged from the crack "Hiawatha" of the Chicago, Milwaukee and St. Paul to the "Asia," built in Japanese railroad shops, running between Dairen and Hsinking in Manchukuo.

Diesel locomotives included those for the Union Pacific's Super Chief, and the Baltimore and Ohio's Royal Blue and Diplomat. In the lightweight, high-speed field were the four Zephyrs of the Burlington, the New York, New Haven and Hartford's Comet, and the first of the southern flyers, the "Rebels" of the Gulf, Mobile and Northern.

In Germany, where high-speed lightweight articulated trains started, the original Flying Hamburger has two new colleagues, the Flying Frankfurter and Flying Koelner.

More significant in Germany, however, was the arrival of three streamlined steam locomotives capable of pulling full-weight heavy trains at 110 miles an hour.

Science News Letter, December 14, 1935

PHYSICS

Cosmic Rays Aid Study Of Nature of Magnetism

COSMIC rays, no longer the mystery they once were, are now used as highly valuable working tools in the scientific laboratory. Their newest use is to help investigate the nature of magnetic forces inside a magnet, according to reports to the American Physical Society.

The nature of such internal magnetic forces has heretofore been almost impossible to investigate. Scientists could easily study the forces outside the magnet with great precision, but what was happening inside the magnet remained a mystery.

High speed and piercing cosmic ray particles, however, are capable of passing right through great thicknesses of iron. By seeing how much their paths are bent in going through the magnet, physicists are now able to acquire knowledge of the magnetic field strength in the magnet's interior.

The technique is similar to the way one might estimate the force of a hurricane storm by the extent to which a ship has been driven off its course.

Two reports describing the theory and experimental studies were presented to the Society by Prof. W. F. G. Swann of Bartol Research Foundation and his colleague, Dr. W. E. Danforth.

Science News Letter, December 14, 1935

IN SCIENCE

BIOLOGY

Heavy Water's Discovery Hampers Biological Study

REPERCUSSIONS of the discovery of heavy water in the science of biology were described to the meeting of the American Physical Society. Heavy water contains the double weight isotope of hydrogen.

Extremely delicate tests checking the effects of powerful drugs and poisons on the animal and human body must now be carefully watched to see what kind of water is used for making the weak testing solutions, said Dr. David I. Macht, pharmacological scientist of Baltimore.

The solutions, Dr. Macht explained, are injected into animals and their effects studied.

What complicates these biologic tests, says Dr. Macht, is his discovery that the effects obtained depend on how much of the water in the solution is of the heavy variety. If only one part in 2,000 of the water is composed of the heavy kind, such important biological products as enzymes react in a vastly different way than they do normally.

Science News Letter, December 14, 1935

PLANT PATHOLOGY

Squirrels, Chipmunks Aid In Fight Against Rust

SQUIRRELS, chipmunks and other small rodents appear to be unwitting allies of man in his fight against the white pine's most destructive disease, blister rust. J. L. Mielke, of the U. S. Forest Service, states (*Journal of Forestry*, Dec.) that he has observed these little animals eating the fungus-caused blisters on the twigs of the afflicted trees.

Since these blisters produce the millions of spores that aid in spreading the rust to other trees, their destruction is decidedly advantageous, from the human-economic point of view.

What the squirrels and chipmunks are after, Mr. Mielke does not know. He conjectures that they may like the taste of the fungus itself, or that they may be after the starchy food-substances that collect in the blisters.

Science News Letter, December 14, 1935

EN FIELDS

PALAEONTOLOGY

Ancient Fossil Animals Mistaken for Hickory-Nuts

PECULIAR fossilized animals, taken by uninformed collectors to be fossil flower buds and hickory nuts, and believed until recently to be very rare in the region of Buffalo, N. Y., have been found in relative abundance there following the researches of Irving G. Reimann, curator of geology at the Buffalo Museum of Science.

Called blastoids, the fossils are related to the so-called meat-eating lilies, or crinoids. They grew upon stalks, like plants, in the waters of a shallow tropical sea that 250 million years ago, in Devonian times, washed over the present site of Buffalo.

Some twenty different varieties of these curious fossils have been identified by Mr. Reimann, including many species new to science. These studies have made Western New York an outstanding locality for Devonian blastoids.

Science News Letter, December 14, 1935

ICHTHYOLOGY

Fish Smother in Lake—Plants Steal Oxygen

HORRORS of a city suddenly blanketed with a suffocating gas, with all its citizens gasping and choking to death, were realized in the world of water recently, when a lake full of fish lost all its oxygen, and all the fish agonizingly died.

The story is told with a considerable sense of drama, by David Tomlinson of Wallingford, Conn. (*Science*, Nov. 1)

About eighteen miles north of New Haven, Mr. Tomlinson states, is a lake between 125 and 150 acres in extent with an average depth of four feet, known locally as the North Farms Reservoir. Its bottom is muddy and very full of weeds, and until the disaster Mr. Tomlinson records its water swarmed with fish.

On a warm morning in late summer, fish were seen crowding to the top in large numbers, evidently in great distress. There were all kinds of them: pickerel, perch, calico bass, bullhead,

sunfish and pond shiners, and they were all gulping air.

By early afternoon the fish were dying by thousands and sinking to the bottom, while those that had been first to die, probably during the preceding night, began to rise to the surface. In the meantime the water began to assume an abnormal milkiness in appearance. In their desperation the fish flopped out of the water, to die gasping on the bank. Even the eels and crawfish crawled ashore to die. About 400,000 fish thus perished, and apparently not one was left alive.

Several scientists from nearby universities examined both the dead fish and the deadly water. They could find no evidence of poison in either; but the fish gave evidence of having died of sheer suffocation—lack of dissolved oxygen. And when the water was tested for oxygen, that necessary element was found to be almost totally lacking.

The cause seems to lie in the sudden death and decay of the thick vegetation in the pond. There had been severe rains, accompanied by abrupt temperature changes, several days before the catastrophe, and the pond had been observed to be "working." Mr. Tomlinson suggests that the water-plants had been killed, and that in the course of the fermentation and decomposition of their dead tissues all the oxygen in the pond had been absorbed by the bacteria and other microorganisms of decay. Disaster to the oxygen-requiring fish immediately followed.

Science News Letter, December 14, 1935

ASTRONOMY

Millions of Square Miles In Great Sunspot Group

THE LARGEST group of sunspots in the past five years was recently visible on the sun. Greenwich Observatory in London found that the area of the sunspot group reached 2,000,000,000 square miles on Sunday, Dec. 1, with a greatest length of 140,000 miles.

The rotation of the sun carried the gigantic group out of sight on Dec. 9. The group was relatively small when it first appeared on Nov. 26.

Greenwich Observatory astronomers under the direction of Dr. H. Spencer-Jones, the astronomer royal, photographed the group several times.

Observations by Mt. Wilson Observatory astronomers revealed the sun had 69 spots upon it, in two groups, on Friday, Nov. 29. Saturday's observations showed 47 spots in two groups.

Science News Letter, December 14, 1935

SEISMOLOGY

Panama Earthquake Was Centered Under Caribbean

THE earthquake felt in the Canal Zone late on Friday night, Nov. 29, had its epicenter under the Caribbean Sea somewhat to the north of the Isthmus. Seismologists of the Coast and Geodetic Survey of Washington, and of the Jesuit Seismological Association in St. Louis, made independent determinations of its location, on the basis of data collected telegraphically by Science Service.

The location of the epicenter is given as in latitude 10 degrees north, longitude 79.5 degrees west. Time of origin was 10.39.8 p. m., E. S. T.

Observatories reporting to Science Service were those of Canisius College, Buffalo, N. Y.; Georgetown University, Washington, D. C.; St. Louis University, St. Louis, Mo.; the University of Wisconsin, Madison, Wis.; the Dominion Observatory, Ottawa, Ont.; and the stations of the U. S. Coast and Geodetic Survey at San Juan, Puerto Rico, Tucson, Ariz., and Chicago, Ill.

Science News Letter, December 14, 1935

ARCHAEOLOGY-SURGERY

Alaska Indians Had Brain Surgeons 2,000 Years Ago

INDIANS in Alaska 2,000 years ago had brain surgeons available. They needed them, too, what with battles in those days being fought with slingshots and clubs.

A specimen of this ancient surgery, the first unearthed in Alaska, is the discovery announced by Dr. Ales Hrdlicka of the Smithsonian Institution. Digging on Kodiak Island, he found the skull of a man who had a cavity about two inches long and half an inch wide scraped in his skull down to a thin film of bone left over the brain. The wound healed perfectly, showing that the Indian brain doctor knew his business.

This skull cutting operation, called trephining, was popular in Europe 10,000 years ago, and was later done by Indians of Peru and some other parts of America. Whether the intention was to relieve brain pressure or merely to let out disease spirits, modern science is not certain.

Finding the operation practised in Alaska indicates strongly, Dr. Hrdlicka said, that the operation was brought to America from Asia by some of the early waves of immigrants who crossed Bering Strait.

Science News Letter, December 14, 1935

From Page 375

been able to indicate possible advances in methods for guiding ships on the high seas and in approaching and maneuvering in harbors. Some of the methods used are peace-time adaptations of ideas first tried during the World War, and others make use of some of the newer developments in short-wave radio.

The original Science Advisory Board, as first appointed by President Roosevelt, included Dr. Isaiah Bowman, President, Johns Hopkins University, then chairman, National Research Council and director, American Geographical Society; Dr. R. A. Millikan, director, Norman Bridge Laboratory of Physics, California Institute of Technology; Dr. Karl T. Compton, *chairman*, president of the Massachusetts Institute of Technology; Dr. C. K. Leith, University of Wisconsin; Dr. W. W. Campbell, then presi-

dent, National Academy of Sciences; Dr. Frank B. Jewett, president, Bell Telephone Laboratories; Dr. John C. Merriam, president, the Carnegie Institution of Washington; Gano Dunn, president, J. G. White Engineering Corp.; and Dr. Charles F. Kettering, president, General Motors Research Corp. The following members of the Board were appointed at a later date: Dr. Roger Adams, University of Illinois; Dr. Simon Flexner, Rockefeller Institute for Medical Research; Dr. Lewis R. Jones, emeritus professor of plant pathology, University of Wisconsin; Dr. Frank R. Lillie, then at University of Chicago and now president, National Academy of Sciences and chairman, National Research Council; Dr. Milton J. Rosenau, Harvard School of Public Health; and Dr. Thomas Parran, State Commissioner of Health, New York.

Science News Letter, December 14, 1935

PHYSICS

Short Wave Radio Effect Found Confirmed by Records

EXISTENCE of the "Dellinger effect," which is the sudden disappearance of short-wavelength radio signals over long distance, is confirmed by the National Broadcasting Company's studies of radio transmission records.

The complete wipe-out of all high-frequency long-distance radio signals on the illuminated side of the globe for short periods is known in commercial parlance as a "drop-out," O. B. Hanson, NBC chief engineer, explained.

Dr. J. H. Dellinger, chief of the National Bureau of Standards' radio section, reported the phenomenon recently and asked other observers to give their experiences. (See SNL, Nov. 9) It was seemingly linked to activity on the sun.

"It is one of the vagaries of short wave transmission but our experience indicates that it is a feature of the 27 day cycle of recurrent magnetic disturbances rather than a 54 day cyclic phenomenon," Mr. Hanson said. "During the year 1930, for instance, when magnetic disturbances were unusually extensive, such drop-outs were quite common and were predominantly linked with the 27 day disturbance sequences."

Confirmation of the Dellinger effect was also found in a check of Harvard's short wave radio transmission records since 1933.

Antiquated and now-obsolete govern-

ment radio regulations are preventing scientists from obtaining needed information about the newly-discovered strange wiping out of short wave radio transmission, Dr. Harry Rowe Mimno of Cruft Laboratory, Harvard University, said in reporting the Harvard confirmation. (*Science*, Nov. 29).

Just as a search of old astronomical photographic plates can tell past information about a new star after it has been discovered, so too have Dr. Mimno's radio records described the severe radio fading which every 54 days appears to stop communication on certain short wavelength bands outside the usual home broadcasting range.

It would be highly desirable, Dr. Mimno indicates, to obtain with automatic equipment a continuous record of radio transmission reception during the recurrent radio "storms." But this was impossible he reports, stating:

"Unfortunately no continuous automatic records could be obtained during the 1935 period covered by Dr. Dellinger's report. During the past 16 months the Federal Communications Commission has repeatedly postponed the rephrasing of certain obsolete regulations limiting the use of automatic apparatus, which effectively block the continuation of fundamental research."

Science News Letter, December 14, 1935

BIOLOGY

Did Life Originate In Unknown Outer Space?

DID LIFE, at least the primitive one called beginnings of it, come to our planet from somewhere else? Are we the descendants of protozoic or protophytic ancestors that "came over" on some meteoritic Mayflower?

Evolution, which has tolerably ready answers for many questions as to how life changed from one form to another, has never had a satisfying solution for the riddle of life's origin itself. Darwin never ventured an answer to this ultimate question, and even after he had become an agnostic he did not change the last sentence in the *Origin of Species*, in which he postulated life as "having been originally breathed by the Creator into a few forms, or into one."

Some speculative biologists and philosophers have undertaken at least to banish this baffling puzzle from this planet, by suggesting that bacteria or other low forms of life may have drifted into the fertile pastures of a young earth, or been borne in from outer space, riding on or in a rushing meteorite.

This view appeared to have gained support at one time through the experiments of Prof. Charles B. Lipman of the University of California, who has found bacteria in all sorts of unlikely places: in coal from deep mines, in the center of large rocks, and finally buried in the masses of stony meteorites.

But now doubt is cast on the validity of his findings, through a repetition of his experiments by a member of the Field Museum staff, Sharat K. Roy, who is versed in the techniques of both geology and bacteriology. Mr. Roy used material from several of the same meteorite falls as those investigated by Prof. Lipman. He sterilized the outsides of these "heaven-stones," tested them to make absolutely sure that they were sterile, crushed them to powder, and planted the powder in a series of twelve tubes of nutrient media.

Nine of the tubes remained without signs of life after weeks of careful incubation. Three showed colonies of bacteria. But when these were examined, it was found that the organisms were common forms on earth. They had either seeped into the stone through crevices and pores, or (more likely) they had somehow got into the culture tubes as accidental contaminations.

So again the concept of life as a celestial hitch-hiker runs up against a Scotch verdict.

Science News Letter, December 14, 1935

PHYSICS

New Tool for Atomic Research In Synthesized Crystals

Lithium Fluoride Which Transmits Light Over Wider Wavelength Range Than Other Substances, Now Grown

A SCIENTIFIC discovery that holds promise of contributing to important research into the atomic structure of matter became known when Prof. Donald C. Stockbarger of the Massachusetts Institute of Technology announced that he has successfully grown in his laboratory large and optically perfect lithium fluoride crystals.

Lenses made from such crystals, because they transmit light over a wider range of wavelengths than any known optical material, are expected to be a powerful new tool for science. Natural crystals of this kind are usually too small for satisfactory use in lenses, and previous attempts to grow large ones arti-

ficially have been unsuccessful until Prof. Stockbarger's research.

Formal announcement of the artificial synthesis was made by Prof. Stockbarger at the meeting of the American Physical Society in Baltimore. Several of the new crystals, including one three inches in diameter, were exhibited.

Lithium fluoride not only transmits light waves from the infra-red region through the visible part of the spectrum but farther into the ultraviolet bands than other substances.

Prime use of lithium fluoride crystals, in fact, should be in studies of the ultraviolet region of the spectrum.

In addition to its use in the ultra-

violet, lithium fluoride should aid in research in the visible range, for it bends the various colors of the spectrum far more equally than other materials. Thus, images made by lenses of this substance are less subject to color fuzziness around the edges, which necessitates the use of compound lenses to offset this effect when glass or quartz lenses are used.

Crystals of lithium fluoride are also expected to aid science greatly in spectroscopic investigations, particularly in atomic research on liquids and some gases which must be confined in a container which permits the transmission of light over the widest possible range of wavelengths. Use of microscopes in various phases of research may also be widely extended by using lenses made from these crystals.

The success of Prof. Stockbarger's method of growing these crystals lies in the synthesis of lithium fluoride salt in the purest form and the growth of the crystals in a specially designed electric furnace capable of precise temperature control. In this way he expects that in the future he will be able to grow crystals even larger than three inches long.

The substance is first produced in the form of a powder and then melted in specially shaped platinum crucibles with conical bottoms. After melting, a slow process of cooling is started and a tiny seed crystal forms in the point of the crucible, growing until the entire substance is crystallized. The finished product can easily be cut to the desired size and shape and polished.

Science News Letter, December 14, 1935

ENGINEERING

"Windbreak" of Trees May Increase Wind Velocity

SOME trees planted along a highway may fail as snow protection or windbreak and instead actually increase wind velocity at the middle of the road, Prof. Franz Aust, of the University of Wisconsin, told the Highway Research Board.

Tests were made by Prof. Aust of the effectiveness as wind barriers of five kinds of trees—white pine, willow, Norway spruce, hard maple, and evergreen snow fence. It was the hard maples that would under certain conditions increase the wind in the road.

The greatest reductions in wind velocity for the various trees varied from 52 per cent. to 97 per cent. of the wind speed where there was no barrier.

Science News Letter, December 14, 1935



GROWING CRYSTALS

Prof. Donald C. Stockbarger of the Massachusetts Institute of Technology has been able to grow artificial lithium fluoride crystals, a triumph of synthesis that is expected to extend greatly the horizon of atomic research. He is shown removing a three-inch crystal from the thin platinum crucible in which it was grown at a temperature of more than 1200 degrees Centigrade. Before him are other crystals he has made while the electric furnace in which they were grown is shown in the background. A peep-hole to enable him to watch the process is in the side of the furnace.

PHYSICS

Atoms Pay Tax; But Energy Not Money Is the Medium

INCREASED taxation has reached down into the realm of atomic particles so small that millions of them could be laid side by side and not reach the width of a dime.

The atom tax is not in the form of money but energy, according to new experiments described to the meeting of the American Physical Society by Dr. G. L. Locher and C. L. Haines of the Bartol Research Foundation.

The energy atom tax occurs in tests on the changing of radiant energy into matter.

In the work reported, gamma rays from a radium-like substance were shot into lead and silver, and particles of matter in the form of positive and negative electrons emerged.

The nuclei or cores of atoms possess the power to transform such gamma rays into material particles.

The speed at which the particles come

out is automatically recorded by the Locher-Haines apparatus. The incoming gamma rays possess a known amount of energy and the atom nucleus acts as a judge to decide how the energy is to be shared among the two new-born particles of matter.

It was expected that sometimes the negative particle would be cut off without inheritance, as it were, the positive particles then acquiring the full energy of the deceased gamma ray.

Such is not the case, Dr. Locher and Mr. Haines found.

The positive particle never has this much energy. Perhaps the atom nucleus decides that the negative electron shall never be sent out without some inheritance in the form of energy. The alternative would be that an inheritance tax is always collected from the positive particle.

Science News Letter, December 14, 1935

RADIO

Radio Through Lightning Possible Without Static

VISIONS of the day when a severe electric thunderstorm will no longer bring crashing static in home radio receivers became a virtual reality when Maj. Edwin H. Armstrong, Columbia University's professor of electrical engineering, showed his radio colleagues his static-free, non-fading system of radio transmission.

From a small experimental radio station atop the lofty Empire State Building Maj. Armstrong has been testing the system for over a year with receivers scattered about the metropolitan area.

Signals from the little 2,000 watt station were recorded 85 miles away on a phonograph record while a bad lightning storm was in progress. Uninterrupted reception and no static was the result. For comparison WEA's 50,000 watt station, recorded at the same time, gave signals full of crashing jars and often unintelligible.

Maj. Armstrong also sent a radio facsimile copy of the front page of a news-

paper through electric storms. Clear readable copy was received. The absence of blurriness denoted the freedom from static. At the same time a musical program was simultaneously transmitted.

This is the first time in his experiments, Maj. Armstrong said, that music and the printed word have been sent and received together.

Fundamental point about the new static-free system, Maj. Armstrong explained before the Institute of Radio Engineers, is the introduction into the transmitted waves of a characteristic which does not exist in radio waves that nature created in causing static. The receiving set is so constructed that it picks up those radio waves having the special "man-marked" characteristics and discards the natural ones of static.

"The theory on which the problems were solved," declared Maj. Armstrong, "flies directly in the face of all previous mathematical deductions. The old theory of the way to shut out static as-

sumed that the best that could be done was to narrow the band of the selective systems at the receiver as much as possible without shutting off the signal. By narrowing the band down to a width just sufficient to admit the signal it was believed that the ratio of signal to static strength would be best.

"Where the signals and disturbances are of the same order of magnitude, I find the exact opposite to be true. With proper methods of transmission and reception, the wider the band, the better will be the signal to noise ratio."

The Armstrong experiments have been carried out on a wavelength of two and one-half meters and have applications, it is indicated, in television broadcasting.

Science News Letter, December 14, 1935

MEDICINE

Widely Used Sex Hormone Obtained From Whales

WHALES will soon be rescuing women from some of the physiological disturbances connected with their sex, as soon as application is made of research conducted jointly by the Antarctic research ship, "Discovery," the British Museum of Natural History and the National Institute for Medical Research, London.

A female sex hormone known as progesterin and widely used in gynecological practice can be obtained as a by-product of the whaling industry instead of from sows killed in slaughter houses. The hormone, surprisingly enough, can be obtained under ordinary whaling conditions and can be preserved in formalin for many months. Authorities believe that the hormone from whales will be widely used, at least until the hormone can be produced synthetically on a commercial scale.

Progesterin is produced by the corpora lutea of the ovaries. Besides playing a secondary sex-stimulating role, it prepares the uterus for reception of the fertilized egg and pregnancy.

Science News Letter, December 14, 1935

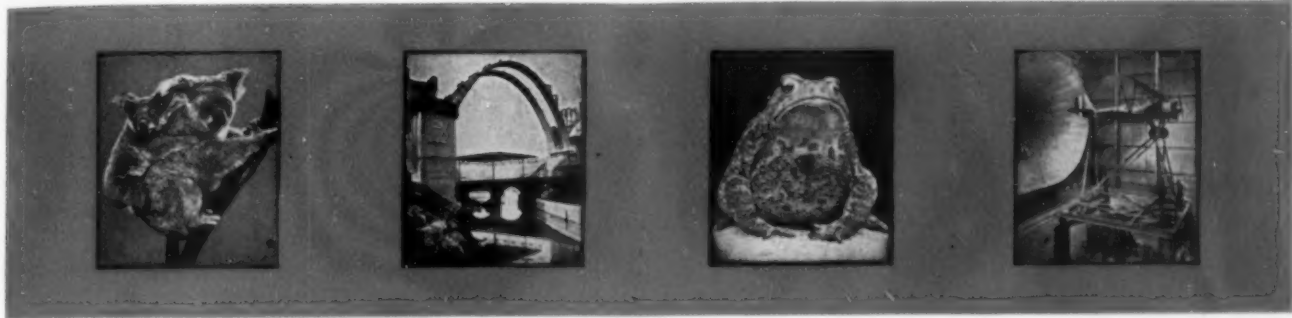
● RADIO

Tuesday, Dec. 17, 4:30 p. m., E.S.T.
RUNNING HORSES—Dr. Harry H. Laughlin, Department of Genetics, Carnegie Institution of Washington.

Tuesday, Dec. 24, 4:30 p. m., E.S.T.
REINDEER AND CHRISTMAS TREES—Dr. W. B. Bell, U. S. Biological Survey, and George A. Duthie, U. S. Forest Service.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

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Industry's Seamstress	The Front Cover	Madame Python Accepts Family Cares.....	Page 51
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To the Heart of a Flower by X-Ray.....	7	55-Ton "Top" to Make Ship Ride Smoothly.....	55
Eyes Reflect the Growing Mind.....	9	New Picture of Ancient Splendor.....	57
From the Breast of a Tiger Knight.....	11	Machine Arm of a New National Link.....	59
Teddy-Bear, Climb for Your Life.....	13	First Control of Hydro-Power	61
Like a Jewel From Fairyland.....	15	Smoke Whirlwinds in Organ Pipe.....	63
Famous Canyon Now National Monument.....	17	Domed Nursery of a Flying Jewel.....	65
Good Heavens, Young Lady!.....	19	Myriads of Sisters, But No Twin.....	67
Web-Fingered, to Swim the Air.....	21	Albino Twins Surprise Robin Parents.....	69
Where Ambition Ended	23	Showerbath of Sparks.....	71
"Of Man Ribber's" Treasure.....	25	She-Wolf Guards Her Young.....	73
Spiny Sculpin Uses Chinese Camouflage.....	27	Dneprostroy's First Spring Freshet.....	75
Two Precious Jewels in His Head.....	29	Strength of Steel Written in Sand.....	77
Not a Fairy's Furry Opera Cloak.....	31	Grotesque Parents: Grotesque Offspring.....	79
New Atom-Smashing Machine	33	In the Form of a Dove.....	81
Warning Spots or Targets?.....	35	Astronomical Observatory or Bloody Altar.....	83
Festooning the Evergreen Tree.....	37	By Hiding, the Sun Reveals Itself.....	85
115 Miles-per-Hour at a Standstill.....	39	It Will Be Over in Five Minutes.....	87
Young Gargoyle Out for a Walk.....	41	In a New Pose.....	89
World's Longest Suspension Span.....	43	Ho-Hum! Even the Cat Gets It.....	91
Wind-Blown Lightning	45	Bucketed Harvester of Power.....	93
Died, Despite Skill of Ancient Surgeons.....	47	New Flame From Billions of Particles.....	The Back Cover
Source of Four-Mile-a-Minute Storm.....	49		

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ECOLOGY

NATURE RAMBLINGS

by Frank Thone



The Worth of Weeds

PLANT weeds. This seemingly heretical suggestion is offered by Prof. Paul B. Sears, botanist of the University of Oklahoma, as possible answer to the challenge of plow-ripped, drought-scourged, wind-drifted lands in the West. Once rich grazing lands, they were broken for wheat and then ruined by drought and winds, so that now they are temporary deserts, good for neither grass nor grain.

Plant weeds, says Prof. Sears, and he points out why:

"It is vital that some cover, no matter what, be developed here without delay. Nature has furnished a hint. Throughout this region after the drought was well begun the despised Russian thistle did so well that it was often the only plant available for stock feed.

"Instead of seeding the area with costly grass seed, whose success is a gamble, it might be sensible to mix in a good proportion of weed seeds. If the land is abandoned, weeds will be the first cover anyhow, and as we have seen, they are a transient affair at best, preparing the way for better kinds of plants."

Lest we should think Prof. Sears' proposal too daring, he hastens to offer

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a precedent—always a consoling thought to the conservatism ingrained even in pioneers and experimenters:

"Actually the method is not new. There is a brilliant example of its use on the bare clay slopes of the huge Ohio Conservancy dams north of Dayton, which today are held in perfect condition by a dense, well developed sod.

"The success of this plant cover was insured from the start by the deliberate use of the cheapest, weediest mixtures of grass and clover seed that could be obtained. The weeds took hold at once, but their more genteel companions are now in full possession, just as the coonskin cap and leather jacket have been

replaced by the fedora and business suit in the one-time wilderness beyond the Alleghenies."

Looked at from one viewpoint, foresters have been practicing Prof. Sears' doctrine of weed cultivation for some time now. In the flush days of American lumbering, only such tree aristocrats as white pine, long-leaf pine, white oak and hard maple were considered really worth the cutting. Species like poplar, jack pine and black locust were looked upon as of small account. But because they will grow fast, and can live on the cut-over, burnt-over deserts of man's making, foresters now actually make extensive plantings of these once-despised "wooden weeds."

Science News Letter, December 14, 1935

PSYCHIATRY

Psychiatrist Cures Paralysis In Almost Miraculous Fashion

THOSE miraculous cures by which healers, saints and shrines build up their reputations are paralleled by six almost instantaneous cures of hysterical paralysis reported by Dr. Abraham Myerson of Boston State Hospital. (*Journal, American Medical Association*, Nov. 16.)

In curing these helpless persons, Dr. Myerson used either the electric current, to "recall" the helpless part into consciousness, or anesthesia. With both treatments went encouragement, instruction, and what the doctor himself calls "legitimate hocus-pocus" or trickery.

Two of the six patients were football players injured on the field. One had received an injury to his spinal cord which set up a numbness of the legs and weakness, the physician explains. The numbness later disappeared but a state of fear set in and the young man could not walk. Having satisfied himself after numerous examinations that this was the case, the physician explained the situation to the young man and told him he would be able to walk out of the office that same day. A powerful electric current was given to the muscles of the front of the leg. They contracted violently. The football player was then told to try to help the electric current and contract the muscles with each stimulation. In a short time the doctor shut the current off. The patient, not knowing this, kept on moving his leg. Convinced then that all was well, he walked out without difficulty.

Another case was that of a well-known university professor. He developed a neurosis associated with difficulty in swallowing. The trouble finally reached the point where the professor could swallow no food, and only with difficulty could he swallow liquids. Dr. Myerson gave the learned man two treatments. He was first told that next day he would be given a mild anesthetic and that when he recovered consciousness he would be able to swallow liquids.

Next day the professor was given nitrous oxide. As he became unconscious, a glass of milk was put to his mouth. When he began to regain consciousness, he was sharply ordered to drink. He drank freely without difficulty. Three days later the experiment was repeated, except that he was assured that he would waken and find himself eating solid food. Accordingly a sandwich was handed him and he began to eat.

The patient's visit ended by the doctor and his assistant and the patient going out to a restaurant where they all ordered a hearty meal. The professor ate with as much readiness as the others. In this as well as the other five cases reported, there was no recurrence.

"The cases are undoubtedly of the kind that make up the roster of miracles," Dr. Myerson concludes. "They are recorded to show that the disease condition disappears when the symptom are explained physiologically and the treatment is rationally directed."

Science News Letter, December 14, 1935

First Glances at New Books

Medicine

A GEOGRAPHY OF DISEASE — Earl Baldwin McKinley—*George Washington Univ. Press*, 495 p., \$5. This is a preliminary survey of the incidence and distribution of tropical and certain other diseases throughout the world. Dr. McKinley directed the study for the National Research Council with the aid of an advisory committee consisting of Dr. Frederick P. Gay, Dr. Richard P. Strong and the late Dr. Theobald Smith. The material is presented in tabular form, showing for each political division studied the presence or absence of the diseases, distribution, approximate number of cases and whether the disease is a public health problem in that particular region. Additional information as to population, area and other conditions of the region is given in a few paragraphs preceding each set of tables. Health authorities and students of tropical medicine will find the book valuable both as a source of information and as a guide to problems needing further study or administrative attention.

Science News Letter, December 14, 1935

Literature

SUGGESTIONS TO AUTHORS OF PAPERS SUBMITTED FOR PUBLICATION BY THE UNITED STATES GEOLOGICAL SURVEY, 4th Edition — George McLane Wood and Bernard H. Lane—*Govt. Printing Off.*, 126 p., 15c. Handy and authoritative, this handbook for authors and editors will be of use also to those engaged in preparation of documents in fields outside geology.

Science News Letter, December 14, 1935

Mathematics

ANSWERS TO INTEGRATED MATHEMATICS WITH SPECIAL APPLICATIONS TO ANALYSIS—John A. Swenson—*Edwards Bros.*, 49 p., Free, with *Integrated Mathematics*.

Science News Letter, December 14, 1935

Plant Diseases

TOBACCO DISEASES AND DECAYS—Frederick A. Wolf—*Duke Univ.*, 454 p., \$5. Tobacco is such an important crop, historically as well as economically, that a book on even one special aspect of its cultivation is certainly well justified.

Dr. Wolf's exhaustive examination of the plant's many ills, their causes and possible cures, will be welcomed alike by both teaching and field pathologists, as well as by the tobacco industry generally.

Science News Letter, December 14, 1935

Chemistry—Physics

HANDBOOK OF CHEMISTRY AND PHYSICS—Twentieth Edition—Ed. by Charles D. Hodgman—*Chemical Rubber Publishing Co.*, 1951 p., \$6. Still larger than ever is the current edition of this standard reference work. Among the new additions are: a 30-page table of the formula index of organic compounds; the chemical constants of organic compounds tabulated in a different form and extended; rules for the pronunciation of chemical terms and organic compounds; and new material in the X-ray and colorimetry sections.

Science News Letter, December 14, 1935

Geology

TECTONIC ESSAYS, MAINLY ALPINE—E. B. Bailey—*Oxford*, 200 p., 5 plates, \$4.25. The Alpine uplift, longest and most intimately known of all high mountain areas, is also one of the most complicated in its structure and in the geologic history which that structure represents. Dr. Bailey turns on its problems a veteran scientist's eye, and clarifies many problems for the benefit of his fellow geologists. The book will certainly become one of the standard reference works on its subject.

Science News Letter, December 14, 1935

Psychology

PSYCHOLOGICAL RACKETEERS—Dorothy H. Yates—*Bruce Humphries*, 232 p., \$2. The name "psychologist" has been invoked to aid in imposing upon the public a stupendous amount of unadulterated hokum. Every community is familiar with the "applied psychologist" who will put you on the road to success, health and happiness, analyze your character, and give you vocational advice. The author, who is associate professor of psychology at San Jose Teachers' College, uses these odd racketeers as subjects for her own psychological research.

Science News Letter, December 14, 1935

Philosophy of Science

MAN — THE UNIVERSE-BUILDER — Richard E. Lee—*Williams & Wilkins*, 443 p., \$3. A non-technical examination of the data of science and an effort to build a comprehensive and comprehensible philosophy around them. Entirely aside from its philosophizing, the book is worth while, especially for the general reader, as a summation of the main facts of the sciences and a brief history of their discovery and development.

Science News Letter, December 14, 1935

Medicine

SEX PRACTICE IN MARRIAGE—C. B. S. Evans — *Emerson Books*, 128 p., \$1.95. Second edition of a small volume of practical advice simply written by a gynecologist.

Science News Letter, December 14, 1935

Entomology

CONCERNING THE HABITS OF INSECTS—F. Balfour-Browne—*Cambridge (Macmillan)*, 169 p., \$1.50. Natural history observations that an intelligent 'teen-age youngster can go out and make for himself. Although the insects are described against a British background, most of the genera are represented on this side of the water, so that the book is useful here also.

Science News Letter, December 14, 1935

Economics and Government

PUBLIC WORKS IN PROSPERITY AND DEPRESSION—Arthur D. Gayer—*National Bur. of Econ. Research*, 460 p., \$3. Originating in studies begun in 1929, this volume was prepared for the National Planning Board and the Federal Emergency Administration of Public Works. It is a study of public works in all their aspects as an agency of economic stabilization.

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VITALISM and MECHANISM A DISCUSSION

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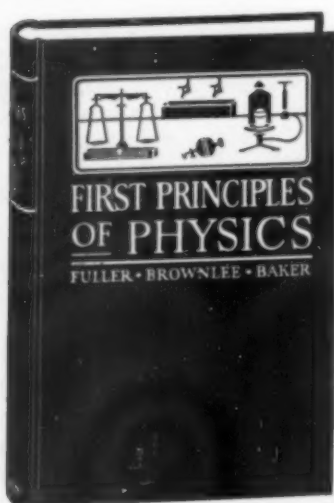
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PHYSICS AND HUMAN PROGRESS

THE DEATH of General Greely recalls the heroic struggle of his party of twenty-five men some fifty years ago. For nearly three years they lost all contact with the outside world and when the rescue party found them only six were alive.

Earlier came the famous expedition of Sir John Franklin and its tragic end.

And later came the expedition of Scott, successful in reaching the South Pole, but ending in tragedy when all his party perished before they could get back to their base.



These heroic expeditions and those of Peary and Amundsen, which though more successful, were yet filled with hardship, are monuments to the indomitable will in the heart of man to surmount the obstacles that stand between him and the mastery of his world.

These obstacles in the polar regions have now been surmounted through progress in physics.

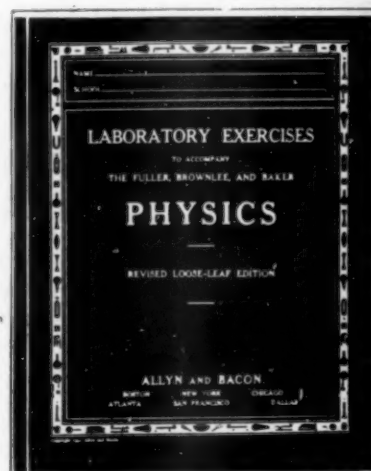
All these fatalities and hardships would have been avoided with the present development of physics.

Physics has banished the terrors of arctic exploration. The twin horrors of darkness and isolation have been conquered. Electric light vanquishes the darkness of the long night. Radio waves flash back and forth between us and Little America. We sit in our homes and listen to the explorers telling us what they have accomplished day by day.

And at the other end of the line special broadcasts bring to the explorers music and entertainment and messages from home.

Physics gives the explorer, in the Arctic or in the interior of vast continents, conquest over space. With the camera in his airplane, he can explore and accurately record the geography of wide horizons which could not be mapped by months of travel on the earth.

Physics has gathered the corners of the earth ever closer and closer together by means of great ships that float, long trains that run on shining tracks, arched bridges that balance from shore to shore, wires that carry voices, and radios that make the world a whispering gallery.



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